This Eco-Refurbishment Sustainability Checklist by GreenSpec™ has been written in the absence of sight or the Decent Homes Standard, and one or two notes have been added having seen it.

Much of this applies to any refurbishment of houses and any refurbishment of other building types.

Feedback is welcome and additions may be made to address building fabric issues if requested.

GreenSpec™ suggest you view this in Word's Outline View: Menu > View > Outline

Decent Homes

Decent Homes programme bringing buildings in states of disrepair or inadequately equipped homes (due to their age and few if any maintenance and improvements over a long period) up to a minimum standard set by ODPM (DCLG now)
http://www.odpm.gov.uk/stellent/groups/odpm_housing/documents/downloadable/odpm_house_027345.pdf
http://www.odpm.gov.uk/stellent/groups/odpm_housing/documents/page/odpm_house_027427-08.hcsp#P277_57554
http://www.housing.odpm.gov.uk
http://www.nhfdhs.co.uk/

This applies to London Borough's, Local Authority's, Responsible Social Landlords (RSL) and Arms Length Management Organisations (ALMO) existing housing stock

How can this process be turned greener without adding to whole life-cycle costs?

Areas considered (prompted by a request from a London Borough RSL with a Decent Homes Project):

Kitchens
Bathrooms
Windows
Electrics re-wiring
Central Heating
Domestic Water supply
Painting and Decorating
Condensation eradication
Roofs Repairs/replacement
Loft Conversion (late addition)
Basements

More things to consider (prompted by a Local Authority Direct Work Force)

Chimneystack repairs
Pointing
Wall Tie replacement
New Lintels
Replacement Doors
Under pinning

The bigger picture first:

Nationwide programme
1m homes by 2010
Contracts for 30,000 to 120,000 houses and bigger are being let with no requirement to address sustainability.

Squandered opportunity (a once in a lifetime opportunity)

This programme represents Government joined up thinking, at its worst, yet again, and proves its lack of commitment to sustainability.

Many publications promoting sustainability prove nothing when actual Government driven project work on the ground flies in the face of all of them.

Most of the existing building stock is well below current Building Regulations Standards and environmental sustainable standards the opportunity to bring buildings up to today's and preferably better standards is staring us in the face.

A million sustainable homes which meet the WWF World Wide Fund for Nature's target adopted by the Government at Johannesburg could be created by this program alone, but government has failed to do the lateral thinking and apply it to the Refurbishment as well as new build, join the two programmes together and we could have 2 million sustainable homes.

But no requirements are being set, and if you replace a water wasteful tap with another water wasteful tap you achieve nothing other than a million taps go to landfill and an ever increasing demand for mains supplied water.

Replacement of those taps with water saving taps in the near future is unlikely to happen and would squander another million taps in the process.

If insulating a property is optional we make no headway towards CO2 reductions.

To suggest replacing a boiler with an efficient one is the first option and insulating the walls of a property is optional and second choice is irresponsible and sets a very bad precedent to anybody reading and applying the Decent Homes Standards.

The Waste Hierarchy promoted by the Environment Agency suggests Reduce is the first issue to address, this applies as much to all services, but the Decent Homes programme has failed to adopt another Government Department's best advice.

Waste generated adding to a 100m tonne/annum burden?

DTI Site Waste Management Plans should be required and Waste reduction Targets should be mandatory.

Essential to introduce on-site segregation

Local

At each house using 2 and 4 wheel bins and fork lift tipper skips
Collect and segregate waste as it is generated
Segregate Hazardous, active, inert, inactive, recyclable, and each material separately

Central

Decant into larger segregated bins or skips

Remote (still on site)

Decant to Rear End Loaders (REL), Front End Loaders (FEL), Roll on Roll off (RORO) and conventional skips ready for collection

Procure off site segregation if impractical on site

Segregate: Hazardous, inert, compressible packaging and mixed to keep landfill tax and gate fee costs down

The choices

Upgrade v Replace
Reusable v Waste
Whole life cost v Initial cost

Opportunities

Comply with EcoHomes (Scotland)
Forget Pass, Good, Very Good and strive for Excellent or better whilst your at it, even if it sets a very low environmental standards and quick easy wins are chosen over substantial improvements.
Improved Energy Refurbishment is critical to meeting CO2 targets
Pathfinder Programme is incredibly wasteful and expensive way to upgrade housing stock;
refurbishment is economical and viable with significant reduction in waste generated and there are opportunities to reclaim and reuse much of the waste.

Energy

More important than new-build, 95% of building stock is well below B Regulations standard thermal insulation and energy consumption
Do away with Fuel Poverty and even better reduce bills to zero.
Adding thermal insulation? 300-600 mm. is optimum.
The suggestion in the Decent Homes standard to put in an energy efficient boiler/heating system without insulating the cavity walls (or any other part) is madness.

DTI UK Fuel Poverty Strategy

http://www.dti.gov.uk/energy/consumers/fuel_poverty/strategy.shtml
http://www.dti.gov.uk/energy/consumers/fuel_poverty/annexes.pdf
Specific programs are now in place which provide additional resources to carry out energy efficiency programmes9.
www.defra.gov.uk/environment/energy/index.htm
The Energy Efficiency Commitment (EEC): This requires electricity and gas suppliers to meet targets for the promotion of improvements in domestic energy efficiency. They do this by encouraging and assisting domestic consumers (in both private and public sectors) to take up energy efficiency measures.
www.defra.gov.uk/environment/energy/eec/index.htm
Warm Front: This scheme tackles fuel poverty among vulnerable households in the private rented and owner occupied sectors.
The scheme provides grants for packages of insulation and heating improvements, including central heating systems, for eligible households.
www.defra.gov.uk/environment/energy/hees/index.htm
Transcos Affordable Warmth Programme: This programme has introduced Affordable Warmth leases targeted at RSLs and LAs. These leases make the installation of high-efficiency gas central heating and energy efficiency measures more financially attractive for both landlords and tenants.

National Green Specification NGS GreenSpec resources:

Regrettably these links are out of date since the launch of the new GreenSpec website in October 2006 & 2010.

Sustainability Checklist:

http://www.greenspec.co.uk/html/checklist/Check-contents.html

Existing Building Sustainability Checklist

http://www.greenspec.co.uk/html/checklist/C-Existing.html
This Eco-Refurbishment Sustainability checklist (this document)
Email BrianSpecMan@aol.com
Bibliography Waste:
http://www.greenspec.co.uk/html/resources/waste.html
Bibliography Existing Buildings:
http://www.greenspec.co.uk/html/resources/exist.html
Material Property Comparisons:
http://www.greenspec.co.uk/html/design/materials/matcontent.html
Material Property Comparisons: Insulation:
http://www.greenspec.co.uk/html/design/materials/insulation.html
Material Property Comparisons Timber: FSC
http://www.greenspec.co.uk/html/design/materials/FSC.html
Product Page Subject index:
http://www.greenspec.co.uk/html/products/productindex.html
Product Page Product Name index:
http://www.greenspec.co.uk/html/spec/CAWsmenu.html
Products Insulation:
http://www.greenspec.co.uk/html/spec/listP10.html
Products Heating Systems:
http://www.greenspec.co.uk/html/products/list751.html
Products Kitchens:
http://www.greenspec.co.uk/html/products/list831.html
Products Bathrooms:
http://www.greenspec.co.uk/html/products/list721.html
Products Paints:
http://www.greenspec.co.uk/html/products/list682.html
Products Doors:
http://www.greenspec.co.uk/html/products/list411.html
Products Windows:
http://www.greenspec.co.uk/html/products/list413.html
Products Waste Plumbing Drainage
http://www.greenspec.co.uk/html/products/list731.html
Specifications:
http://www.greenspec.co.uk/html/spec/CAWsmenu.html
Specification: Construction Resource management/Waste minimization
http://www.greenspec.co.uk/html/spec/listA38.html
Specification: Demolition/Deconstruction Resource Recovery
http://www.greenspec.co.uk/html/spec/listC20.html
Specification: Alteration Resource Recovery/Waste Minimisation
http://www.greenspec.co.uk/html/spec/listC91.html
Presentation papers on waste issues:
http://www.greenspec.co.uk/html/resources/downloads.html
Editorial Articles:
http://www.greenspec.co.uk/html/design/articles.html
Articles: WWF 1 Million Homes
http://www.greenspec.co.uk/html/design/WWF1.html
Articles: Sustainable Housing
http://www.greenspec.co.uk/html/design/hsass/hsass1.html
Articles: BedZED Materials Guide
http://www.greenspec.co.uk/html/design/bedzed/bz1.html
Articles Waste:
http://www.greenspec.co.uk/html/design/BREprevt.html

Approach for each of the areas considered: rather than blanket replacement

Retain Refurbish and Reuse
Removal
Replacement

Kitchen Refurbishment

Don't automatically take it out if its 20 years old if it is still serviceable.
New worktops
Solid wood laminate (not plastic laminate)
Ikea have 2 options Beech and Birch
New fronts
Not MDF nor chipboard
Solid wood or ply
Forest Stewardship Council (Forest Stewardship Council (FSC)) certified wood and ply
http://www.greenspec.co.uk/html/design/materials/FSC.html

- *Reclaimed fronts*
- New sinks
  - Not plastic or plastic conglomerate e.g. Corian
  - Stainless steel
    - Shallow rectangular bowels for family houses with oven cookers
    - Round conical bowel (small water capacity for small units) for 'microwave man'
    - Double round conical bowel for wash and rinse (small water capacity for large family units)
- New sink taps
  - Not plastic
  - Taps 2 flow settings
    - Low flow sprinkler for rinse and full flow to fill sink
    - Isolator/flow restrictor valves on supplies on low flow setting
- New Appliances
  - Energy efficient A+ Rated (high within A+ range)
  - Significant cut in fuel use, costs and CO_2 generation over life of building
- New waste bins
  - With segregation compartments
  - minimum 3 compartments
  - Compostable
    - No in sink waste food grinders
    - (feed rats, overload sewerage works, waste resource)
  - Recyclable
  - Waste

Kitchen Removal

- Waste Resource Action Programme (WRAP) not interested
- Careful removal
  - Value in materials for reuse
- Reuse on or off site
  - Stainless steel sinks
  - Taps
- Export to 3rd world
  - They want 'a kitchen' let alone 'a decent one'
  - ARC Solutions with DORWIN and BKP (Waste) offer a solution they want cargo ships full
  - http://www.greenspec.co.uk/html/spec/listC91.html
  - http://www.greenspec.co.uk/rtf/APP_FFEI_Furniture.rtf
- Recycling opportunities off-site
  - Chipboard: complications with melamine facings
  - MDF: complications with melamine facings
  - Copper pipe
  - Lead pipes (back to lead roofing manufacturers)

Kitchen Replacement

- New design better layout around 'wash prep cook triangle' don't forget left handed people, but don't forget efficient plumbing and drainage
- Maximise reuse of existing drains below floor and ground
- Other finishes may require removing/replacing/refinishing?
- New Carcass
  - Plywood and durable softwood
  - Forest Stewardship Council (FSC) certified wood and ply
- New worktops
  - Solid wood laminate
    - Ikea has 2 options
- New fronts
  - Not MDF nor chipboard
  - Solid wood or ply
  - Forest Stewardship Council (FSC) certified wood and ply
- New Sinks and taps
  - Not plastic
  - Stainless steel
    - Shallow rectangular bowels for family houses with oven cookers
    - Round conical bowel (small water capacity for small units) for 'microwave man'
    - Double round conical bowel for wash and rinse (small water capacity for large family units)
  - Taps 2 flow settings
    - Low flow sprinkler and full flow to fill sink

- Isolator/flow restrictor valves on supplies, set low
- New Appliances
  - Energy efficient A Rated (high within A range)
  - Significant cut in fuel use, costs and CO_2 generation over life of building
- New waste bins
  - With segregation compartments
  - Minimum 3
  - Compostable
  - Recyclable
  - Waste

Bathrooms Refurbishment

- *Don't automatically take it out if its 30 years old if it is still serviceable.*
- Recoating baths insitu
- New bath fronts and surrounds
  - Plywood and durable softwood
  - Forest Stewardship Council (FSC) certified wood and ply
- Replacing Taps
  - Low flow sprinklers
  - Proximity taps
  - Isolator/flow restrictor valves on supplies, set low
- WC Cisterns
  - Water saving devices
  - Hippo and Gel bags
- New Showers
  - Not electric heater shower
  - Not power shower
  - Low water use showers
  - Hot water supply
  - Aerating valves into shower head connection

Bathroom Removal

- WRAP not interested
- Careful removal
  - Value in materials for reuse
- Segregation on site
  - China & Ceramics
  - Steel & Cast Iron
  - Plastics
  - Taps (brass/chrome or plastic and plastic/chrome)
  - Timber
- Reuses off site especially character pieces and in quantity
  - China
  - Cast Iron
  - Taps (brass/chrome) adding low flow valves
- Recycling off site
  - China and ceramics as aggregate in concrete
  - Steel into steel making
  - Plastics Acrylics have a market now
  - Timber: chipping for chipboard and ply

Bathroom Renewals

- New appliances and materials
- Water efficient appliance and taps
- Low water WC & Cisterns
  - Low flush 4.5 litre
  - Dual flush 4/2.5 litre
- Basins
  - Locally sourced?
- Toilet seat and lid
  - Forest Stewardship Council (FSC) Certified timber
  - Tough rigid plastics
- Baths
  - Water efficient profile
  - low capacity to overflow
- Taps
  - Low flow sprinklers
  - Proximity taps
  - Isolator/flow restrictor valves on supplies, set low for:
    - Inefficient designer taps
    - High flow rate taps

- Showers
  - Not electric heater shower
  - Hot water supply
  - Not power shower unless water flow rate is too low for adequate shower
  - Efficient low water use showers gravity-fed
  - Aerating valves into shower head connection
- Bath fronts and surrounds
  - Plywood and durable softwood
  - Forest Stewardship Council (FSC) certified wood and ply or composites

Window and door refurbishment

- Timber
  - Victorian timber windows 100 years old, why stop now?
  - If in good state of repair consider upgrading with new DGSU and modify beads or frame
  - Modern alternative
    - Timber: 60 years with maintenance regime
    - Timber/Aluminium composite: 60 years with maintenance regime
  - Companies specialise in timber window refurbishment/upgrade
    - Insitu or at factory
    - Phased working to suit programme
  - Consider High Performance Micro-porous Finish to all faces
  - Coat before reinstalling
  - Forest Stewardship Council (Forest Stewardship Council (FSC)) certified wood and ply
  - http://www.greenspec.co.uk/html/design/materials/FSC.html
- Steel
  - Failed galvanizing
    - Scrape down and re-protect with zinc rich epoxy paint scheme
    - Consider removing, stripping, pickling and re galvanizing
  - Failed paint system
    - Scrape down and redecorate with relatively short life paint scheme or better still long life paint scheme.
  - Failed Powder Coating
    - Shorter life expectancy early gloss formulations but unlikely to have failed (gloss 10 year guarantee whilst matt 15 years, life expectancy much longer)
  - Single glazing
    - May be scope to obtain replacement metal beads to suit DGSU
- Aluminium
  - Mill finish
    - White oxidation deposits can make casements and door leafs stick
    - Wire wool and lubricant
  - Powder Coating
    - Shorter life expectancy early gloss formulations but unlikely to have failed (gloss 10 year guarantee whilst matt 15 years, life expectancy much longer)
- PVC
  - Short life already?
  - Too soon to need replacing.
  - Refurbishment by own staff after trining
    - PVC Solutions: Specialist Training Consultancy for all PVCU issues
    - http://www.pvcsolutions.co.uk
    - T 01795 474768 M 07966 477434
    - Comprehensive service on offer.
  - Modern alternative
    - PVC: 12 and 20 years or less, difficult to maintain, ironmongery failures,
  - Bespoke PVC profiles
  - WRAP Guide to window disassembly for recycling
- *Fire Doors:*
  - Individually certified BWF Certifire doors, frames, ironmongery, glazing and other accessories, etc. to permit selective modification,
  - TRADA doorsets, doors, frames, and other accessories
  - FIRAS certified installers to remove doors and frames for reuse?
  - Forest Stewardship Council (Forest Stewardship Council (FSC)) certified wood and ply and doors,
  - http://www.greenspec.co.uk/html/design/materials/FSC.html
- *Ironmongery*

- Responsible for premature failure of PVC windows and doors
- Maintenance programmes where RSL regularly washes windows inside and out taking the opportunity to inspect and maintain ironmongery.
- Letter, cat and dog flaps: external and internal: checking they are there and air seals are intact, to minimise heat losses.
- Handles: check secure, not dropping, not loose.

Window and door removal

- WRAP/BRE Conference 4th Oct 2004 See Web sites for papers and publications
- Recycling flat glass
- Publication issued
- Report to be published
- Separating materials on site
  - Glass & Sealed units
  - Putty Spoils glass recycling recipe
  - Sealants: Hazardous waste
  - Frames
    - Wood
    - Steel
    - Aluminium
    - PVC
  - Beads
  - Frame Reinforcement
  - Spacers
  - Ironmongery
  - Fasteners
  - Weather-stripping
- *Fire Doors:*
  - FIRAS certified installers to remove doors and frames for reuse?

Window and door replacements

- Materials
  - Avoid short life PVC
  - Avoid high embodied energy Aluminium (unless recycled)
  - Consider thermally broken steel
  - Consider durable timber
  - Consider durable timber with aluminium bottom bead and sill
  - Consider durable timber with bottom bead, sill & aluminium outer face
  - Forest Stewardship Council (Forest Stewardship Council (FSC)) certified wood and ply and doors
  - http://www.greenspec.co.uk/html/design/materials/FSC.html
- Finishes
  - Consider High Performance Micro-porous factory finish to all faces
- *Fire Doors:*
  - BWF Certifire doorsets, doors, frames, and other accessories
  - TRADA doorsets, doors, frames, and other accessories
  - FIRAS certified installers to remove doors and frames for reuse?

Electrics refurbishment

- Wiring
  - Little scope to refurbish wiring
  - Its normal practice to update wiring, is this driven by insurance?
  - But is it necessary?
  - The Copper may be okay but the plastic sheathing may not.
  - If so why put in more of the same?
- Accessories
  - Reusing of existing accessories, face plates, switches, if in working order
  - Updating of accessories if required
  - Reconsider updating if unnecessary

Electrics removal

- Wiring
  - If run in conduit ensure draw wires are introduced as wires are withdrawn
  - PVC sheathed wires are bad news in landfill sites
  - Copper in landfill is a serious waste of resources
  - Segregate wires from all other waste and recycle copper and PVC

Electrics replacement

- Wiring
  - Take the opportunity to replace PVC sheathed cable
  - Consider Low Smoke sheathed cable (Not PVC sheathing)
  - Consider surface mounting in hollow skirting, dado and architraves

- Avoid burying wiring in or under thermal insulation without increasing wire gauge to suit and insulation to avoid cold bridge,
- New Electric Services
  - Avoid adding electric heating, cooking, hot water, showers etc. unless Renewable supply is provided
  - Consider replacing any electric services with alternatives
- Electricity supply
  - Consider CHP to provide electricity and heat
  - Where controllable obtain Green Tariff electricity supplies
  - Provide Green tariff anyway,
  - Use Green tariff throughout contract

Central Heating Refurbishment

- Thermal Insulation

http://www.greenspec.co.uk/html/products/list681.html

- Building fabric
  - Don't improve/replace heating system until insulation is improved as much as possible
  - Optimum 300-600 mm.
  - New boilers may be efficient but cost a lot,
  - You get more insulation per pound than boilers
  - With good insulation the size of boiler needed will reduce significantly
  - The benefits are enormous: initial costs, running costs, CO_2 reduction
- Pipes or voids
  - Lagging pipes is labour intensive and often incomplete
  - Insulated foam rubber is okay if sizes are available
  - Corners, tees and bends often inadequately carried out
  - Consider filling the voids they are contained within
  - Pour in or spray on fibrous materials fills voids well
- Heating Boilers
  - Check efficiency compared to A rated today
  - SEDBUK Efficiency Rating A
  - Gas: 91.3% - 90.0%; LPG: 93.3% - 90.0%; Oil: 97.0% - 90.0%
  - If significantly lower replace
  - Check inter-seasonal efficiency as well
  - http://www.boilers.org.uk
  - http://www.est.org.uk
- Flues
  - Check for blockages and damage and smoke blow back
  - Check for efficiency and check attachments for leakages
- Radiators
  - Size:
    - If very bulky Cast Iron may benefit from replacement with thin radiators if rooms small
  - Performance and repair
    - Check for air locks and bleed
    - Check for corrosion and leaks
    - Check valves and leaks
    - Add TRV Thermostatic Radiator Valves if not present
  - Windows
    - Consider moving away from under window
    - Best heat goes out the window if ajar
    - Heat goes through window if of low performance
  - Reflectors:
    - Consider fitting purpose made reflector roll or sheet to wall behind radiator
- Pipes
  - Reuse if possible
  - Remove paint and start again
  - Copper
    - Can be reused and should be if possible
    - Ensure earth bonding is in good condition
  - Plastics
    - Its too soon to be replacing them

Central Heating Removal

- Thermal Insulation

http://www.greenspec.co.uk/html/products/list681.html

- Building fabric
  - Reuse
    - Do not remove unless a health hazard or so badly fitted it causes cold bridges
    - Consider for reuse on site if suitable
  - Recycle
    - Bag up, label and segregate from other waste
    - Some manufacturers use recycled content but want large quantities
    - Consider segregation on or off site at transfer stations/bulking stations
    - return to manufacturer in quantity
- Pipes or voids
  - Un-lagging pipes is labour intensive, expensive and often incomplete
  - Insulated foam rubber is easily removed unless taped at all joints
  - Insulated foam rubber is easily reusable

Heating Boilers
- Remove low A-D rated boilers or if incompatible with updated system
- Strong refurbishment and resale market exists
- Damaged boilers can be used for salvaging components to repair others

Flues
- Reuse masonry chimneys and flues is suitable
- Check for blockages and damage and smoke blow back
- Check for efficiency and check attachments for leakages
- Insitu repairs if possible
- Asbestos based
  - Replace Asbestos based
  - Take extra care with parts and dust
  - Hazardous waste: segregate, back up and seal
  - Send to licensed Hazardous Waste sites via Licensed Haz. Waste Carriers
- Cast Iron will have resale value

Radiators
- If very bulky Cast Iron may benefit from replacement with thin radiators if rooms small
- Check for air locks and bleed
- Check for corrosion and leaks
- Check valves and leaks
- Add TRV Thermostatic Radiator Valves if not present

Pipes
- Reuse if possible
- Remove paint and start again
- Copper
  - Can be reused and should be if possible
  - Ensure earth bonding is in good condition
- Plastics
  - Its too soon to be replacing them

Central Heating Replacement

Thermal Insulation

http://www.greenspec.co.uk/html/products/list681.html
- Building fabric
  - Don’t replace heating system until insulation is improved as much as possible
  - Optimum 300-600 mm.
  - New boilers may be efficient but cost a lot,
  - You get more insulation per pound than boilers
  - With good insulation the size of boiler needed will reduce significantly
  - The benefits are enormous: initial costs, running costs, CO_2 reduction
- Pipes or voids
  - Lagging pipes is labour intensive and often incomplete
  - Insulated foam rubber is okay if sizes are available
  - Corners, tees and bends often inadequately done
  - Consider filling the voids they are contained within
  - Pour in or spray on fibrous materials fills voids well

Heating Boilers
- Condensing boilers

Seasonal Efficiency of Domestic Boilers in the UK
http://www.sedbuk.com/
Energy Saving Trust Product Endorsement Scheme highlights top 8 boilers
http://www.est.org.uk/
Use SEDBUK Efficiency Rating A, (there is no need to drop to B or C)
Gas: 91.3% - 90.0%; LPG: 93.3% - 90.0%; Oil: 97.0% - 90.0%
Check inter-seasonal efficiency as well
If using under-floor heating look as modular (modulating) boilers and those designed to work with them
Ensure in-use performance is optimum
http://www.boilers.org.uk

Flues
Double skin insulated stainless steel flue liners

Radiators
Size:
Bulky Cast Iron radiators may not be appropriate in small dwellings
But they are durable and robust
Thin steel radiators if rooms small

Performance
Add TRV Thermostatic Radiator Valves if not present

Windows
Consider new design moving radiators away from under window
Best heat goes out the window if ajar
Heat goes through window if of low performance

Reflectors:
Fit purpose made reflector roll or sheet to wall behind radiators

Pipes
Reuse existing, teeing off where required, if possible
New Materials
Copper
Add earth bonding
Plastics
What design life?
What guarantees?

Domestic Water supply Refurbishment

Thermal Insulation

Pipes or voids
Lagging pipes is labour intensive and often incomplete
Insulated foam rubber is okay if sizes are available
Corners, tees and bends often inadequately done
Consider filling the voids they are contained within
Pour in or spray on fibrous materials fill voids well

Tank
Inspect and repair any damage to existing insulation
Allow inspection to tank and allow for replacement

Cylinder
Inspect and repair any damage to existing insulation
Feel all way around back of cylinder to check
Loose jackets are not ideal but multiple overlapping layers helps

Pipes
Lead
Must be replaced

Copper
Can be reused and should be if possible
Ensure pipes and earth bonding is in good condition

Plastics
Internally: Its too soon to be replacing them
Below ground pipes: inspect for serviceability

Heat source
Heating boiler
Check efficiency compared to A rated today
SEDBUK Efficiency Rating A
Gas: 91.3% - 90.0%; LPG: 93.3% - 90.0%; Oil: 97.0% - 90.0%
If significantly lower replace
http://www.boilers.org.uk
http://www.est.org.uk

Hot water boiler

- Water heaters over sinks
- Tanks
  - Inspect for corrosion or other
  - Inspect valve for corrosion deposits or operational weakness or failure
  - Replace valves with low noise, efficient filling and minimise water loss
- Cylinders
- Taps
  - Sink Taps variable flow settings with 2 stops
  - Low flow sprinkler and full flow to fill sink and between
- Valves
  - Isolator/flow restrictor valves on supplies, set low

Domestic Water supply Removal

- Thermal Insulation
  - Pipes or voids
    - Un-lagging pipes is labour intensive, expensive and often incomplete
    - Insulated foam rubber is easily removed unless taped at all joints
    - Insulated foam rubber is easily reusable
  - Tank
    - May prove difficult unless demountable or flexible or smashed
    - Avoid smashing asbestos fibre cement tanks
  - Cylinder
    - Segregate copper cylinders, insulation jackets and pre-insulated cylinders
    - Take care removing avoiding damage
    - There are refurbishment markets and resale/scrap value
- Pipes
  - Pipes or voids
    - Unlagging pipes is labour intensive, expensive and often incomplete
    - If pipes being reused leave on and cover with more high performance insulation
    - Insulated foam rubber is easily removed unless taped at all joints
    - Insulated foam rubber is easily reusable
  - Lead
    - Recycle via scrap merchant to lead roofing manufacturers
  - Copper
    - Recycle pipe via scrap merchant
    - Recycle earth bonding by separating PVC sheathing and copper
  - Plastics
    - Internally: Its too soon to be replacing them
    - Recycle by diverting them from landfill
- Heat source
  - Heating and/or Hot water Boilers
    - Remove low A-D rated boilers or if incompatible with updated system
    - Strong refurbishment and resale market exists
    - Damaged boilers can be used for salvaging components to repair others
  - Water heaters over sinks
- Tanks
  - Inspect for corrosion or other
  - Inspect valve for corrosion deposits or operational weakness or failure
  - Replace valves with low noise, efficient filling and minimise water loss
- Cylinders
- Taps
  - Sink Taps variable flow settings with 2 stops
  - Low flow sprinkler and full flow to fill sink and between
- Valves
  - Isolator/flow restrictor valves on supplies, set low

Domestic Water supply Replacement

- Pipes or void Insulation
  - Lagging pipes is labour intensive and often incomplete
  - Insulated foam rubber is okay if sizes are available
  - Corners, tees and bends often inadequately done
  - Consider filling the voids they are contained within
  - Pour in or spray on fibrous materials fills voids well
- Pipes
  - Reuse existing, teeing off where required, if possible
  - New Materials
    - Copper

- Add earth bonding
- Plastics
  - What design life?
  - What guarantees?
- Heat source
  - Boilers
    - Condensing boilers
    - Use SEDBUK Efficiency Rating A, no less
    - Gas: 91.3% - 90.0%; LPG: 93.3% - 90.0%; Oil: 97.0% - 90.0%
    - Ensure in-use performance is optimum
    - http://www.boilers.org.uk
    - http://www.est.org.uk
  - CHP
  - Solar Thermal Panels
    - http://www.greenspec.co.uk/html/design/materials/solarcollectors.html
  - Geothermal Ground Source Heat Pumps
    - http://www.greenspec.co.uk/html/design/materials/GSHP.html
  - Others?
- Tanks
  - New plastic tanks flexible to get into attic through hatch
  - Set as high as possible/practical to maximise shower flow and avoid desire for power shower
- Cylinders
  - Pre-insulated and certified for Future Building Regulations requirements
  - Accommodate Solar Thermal or other sources
  - Purpose made solar cylinders, usually well insulated including valves etc.
- Taps
  - Low flow sprinklers
  - Proximity taps
  - Isolator/flow restrictor valves on supplies set low
- Low water WC & Cisterns
  - Low flush 4.5 litre/minute
  - Dual flush 4.5/2.5 litre/minute
- Showers
  - Not electric heater shower
  - Hot water supply
  - Not power shower
  - Low water use showers gravity-fed
  - 9 litres/minute maximum
- Valves
  - Isolate all appliances, etc. with flow reduction/isolation valves
  - Minimise occurrence of drain-down to replace valves, washers or taps

Painting and Decorating Refurbishment

- Health and Safety:
  - Older properties may have arsenic in paints (dark green and many layers down in old paint build up)
  - New properties may have arsenic based preservative treatments in timber
  - Protection of labour with breathing filter is acceptable
  - Protection of labour with breathing apparatus is impractical and unwelcome

Painting and Decorating Removal

- Health and Safety:
  - Older properties may have arsenic in paints (dark green and many layers down in old paint build up)
  - New properties may have arsenic based preservative treatments in timber
  - Protection of labour with breathing filtre is acceptable
  - Protection of labour with breathing apparatus is impractical and unwelcome by tradesmen
  - Removal of preservative treated joinery to hazardous waste site is easy expensive inappropriate solution
  - Burning on site is not the solution and a waste of energy

Painting and Decorating New

- Use natural water-based low-VOC paints stains and other finishes
- Avoid synthetic Low-VOC or solvent-based

Condensation eradication Refurbishment

- Airtightness
  - Build-tight ventilate-right
  - Windows and doors

- Testing of fabric
- Sealants (benign type?)
- Insulation
  - Natural Insulation
  - Hygroscopic insulation in breathing construction?
  - Airtightness layer
  - Vapour Barrier (Vapour check)
  - Breather Membranes
- Ventilation
  - Passive stack ventilation
  - Mechanical Ventilation (extraction) with Heat Recovery

Condensation eradication Removal

- Airtightness
  - Build-tight ventilate-right
  - Windows and doors
  - Testing of fabric
  - Sealant replacement (benign type?)
- Insulation
  - Natural Insulation
  - Hygroscopic insulation in breathing construction?
  - Airtightness layer
  - Vapour Barrier (Vapour check)
  - Breather Membranes
- Heating:
  - Free standing paraffin heaters
- Ventilation
  - Mechanical Ventilation without Heat Recovery

Condensation eradication: New work

- Airtightness
  - Build-tight ventilate-right
  - Windows and doors
  - Testing of fabric
  - Sealants: (benign type?)
- Insulation
  - Natural Insulation
  - Hygroscopic insulation in breathing construction?
  - Airtightness layer
  - Vapour Barrier (Vapour check)
  - Breather Membranes
- Ventilation
  - Passive stack ventilation
  - Mechanical Ventilation with Heat Recovery

Roof Repairs

- *Clay and Slate roof tiles have a long life, don't automatically replace them*
- Durability and life expectancy: any time left?
- Necessary?

Roof Removal

- Salvage Industry well established
- Palleting/crating, restraint/protection, labelling/scheduling
- Reinforcing
  - Forest Stewardship Council (Forest Stewardship Council (FSC)) certified wood and ply
  - http://www.greenspec.co.uk/html/design/materials/FSC.html

Roof Replacement

- Compatible weight with existing roof based on existing loads
- New Roof timbers:
  - Forest Stewardship Council (Forest Stewardship Council (FSC)) certified wood and ply
  - http://www.greenspec.co.uk/html/design/materials/FSC.html

Masonry Repairs

- *Pointing*
  - Care with dust generated by raking mortar joints
    - Breathing apparatus essential
  - Ideally all repairs done without rebuilding
    - Just re-pointing if appropriate
  - Using all existing bricks if not frost damaged
    - Reclaim and record original position and reuse in same orientation
- *New Lintels*

Necessary if window proportion is changing but this should be avoided
Avoid concrete in external walls causing cold bridges
Pinning to avoid brickwork above failing

Wall Tie replacement

Cavity walls only
Galvanized tie failure?
Stainless steel replacement ties fitted from wall face

Under pinning

Concrete
Consider GGBS Cement if programme permits slower strength development
Consider Recycled Aggregate
Plan work to use any excess deliveries on site temporary works, hardstanding

Chimneystack repairs

Ideally all repairs done without rebuilding
Just re-pointing if appropriate
Using all existing bricks if not frost damaged
Reclaim and record original position and reuse in same orientation
Highest and most exposed bricks
may be cement mortar with no lime
difficult to reclaim

Masonry Removal

Care with dust generated

Breathing apparatus essential

Care with risk of damaging any retained construction and fixtures
Reclaim bricks

Reclaim all existing bricks if not frost damaged
Reclaim and record original position and reuse in same orientation
Highest and most exposed bricks
may be cement mortar with no lime
difficult to reclaim

Masonry Replacement

Care to use same construction and materials as existing to avoid cold bridges
If insulated dry lining added consider frost resistance of cold brickwork

Loft conversion from attic space

Related topics

Services:
There will be
Electrics re-wiring
Central Heating
Domestic Water supply
Make sure water supply tanks are as high as possible to maximise water pressure for showers to avoid need for powershowers.

Construction

Roofs Repairs/replacement
Condensation eradication
Painting and Decorating

Additional topics

Structure

Ceiling joists are not adequate for floor loadings
Difficulty in fitting new floor joints between ceiling joists if cables run through the ceiling joists.
Depths of rafters may be inadequate for insulation and ventilation zone depth
Consider adding battens to underside to increase depth
Consider removing roofing tiles or slates, add battens to top of rafters
In extreme situations conservation officers prevent the roof being raised so there is no room for insulation if the ceiling is exposed
One of the few times I would recommend and specify one of the multi layer reflective foil insulations,
They are thin to fit into existing gaps and can be squashed between timbers.
%%%

Basements:

If there is a basement that can be used for storage vessels then many higher grade environmental improvements can be considered:
Rainwater Harvesting for reuse in:

flushing toilets,
washing machines,
garden irrigation/watering
washing cars

Composting toilet chamber for generating compost for the garden

Thermal store for inter-seasonal heat transfers using solar thermal panels and heat recovery on waste pipes and other sources.

Storage for spare materials from the work for use in long term maintenance

Additional storage for family effects

Solid Biomass fuel storage

Additional accommodation